POWER NETWORKS

Battery Energy Storage Systems (BESS)

Overview

PSC offers in-house know-how and proven engineering competencies to develop opportunities and provide solutions for clients looking to achieve benefits from investing in Battery Energy Storage Systems (BESS).

Regardless if your requirement is for opportunity assessment, connection studies or engineering support to determine appropriate BESS capacity and ratings; to specify, evaluate, procure, or integrate a BESS into a new or existing facility, PSC can tailor a solution for you. PSC also offers the capabilities to help improve or transform your business's energy objectives.

PSC engineers have a thorough understanding of the available BESS technologies to advise on such matters as the pros and cons of competing inverter technologies and various battery chemistries, as well as being able to quantify the effects of varying levels of BESS integration capability offered by vendors on the cost of balance of plant and on the overall round-trip efficiency of BESS installations.

Key capabilities

- Develop new revenue streams available by participating in the electricity market
- Evaluate opportunities with long-duration BESS to reduce grid dependence on fossil fuels
- Technical support to developing a business case for BESS
- Reduce carbon footprint and improve the sustainability of your operations
- Reduce plant combustion emissions to mitigate the risk of exceeding license requirements
- Implement virtual synchronous generators and synthetic inertia
- Reduce maintenance and operating cost of your generation plant
- Increase the efficiency of your islanded energy generation and distribution
- Contribute to, and benefit from, the ancillary services, contingency (FCAS) market
- Improve remote location energy continuity and security
- Implement grid forming and black start solutions to support grid security
- Better understand and manage battery degradation and project life
- Load demand leveling
- Provide spinning reserve with BESS

Where can PSC help?

- Due diligence, technical assessment and load assessment, and BESS sizing for various applications such as intermittent power generation output firming, or load variability support
- Optimization of BESS integration to a wholesale electricity market and distribution system
- Optimization of grid-scale BESS for solar PV and wind farm output firming, or energy and reserve market participation
- Development of concept design documentation, including single line diagrams, cable schedules and substation layout drawings
- Development of performance specification and datasheets for BESS systems
- Protection modeling and determining settings for the BESS system
- Power System Modeling including both dynamic and steady-state modeling
- Dynamic modeling for BESS integration with diesel and gas generators
- Develop applications for registration of generators
- On-site benchmark and compliance testing
- Independent tender assessment
- BESS facility preliminary hazard analysis (PHA) and risk assessments
- Independent technical advice and review of EPC designs
- Evaluate service life and round-trip efficiency of BESS installations
- Develop guaranteed performance criteria for tenders and contracts
- Facilitate understanding of and compliance with regulatory requirements
- Provide owner's engineer services
- Factory inspection and witnessing services
- Commissioning support

PSC relevant specialists

- Principal engineers and technical advisors
- Project managers
- Senior engineers
- EMT and RMS modeling specialists
- Power quality performance testing specialists

Engineering experience

PSC engineers have played and are currently playing key roles in delivering BESS projects with the following scope:

- OE and technical advisor roles for several clients looking to improve their plant efficiency and reducing carbon footprint of islanded power generation stations for processing and storage facilities.
- Technical advisor for large-scale network connected BESS of 100MW/150MWh - providing technical advice to owner, developing technical and functional specifications, and subsequently reviewing detailed design, IFC documents, drawings and providing technical advice through project delivery.
- Technical advisor to national energy generator for tendering large-scale BESS 250MW/250MWh to be integrated into network infrastructure at various locations. Providing single line diagrams technical specifications, developing performance criteria, tender evaluation, technical comparison reports, advising on proposed Battery Chemistries, and evaluating round trip efficiency.
- Technical advisor for 50MW/300MWh BESS implemented with Flow Battery technology. Providing technical support for inverter technology specific to Flow Battery applications.
- Developing functional and technical specifications for a range of grid-connected battery-only and hybrid plants across the NEM as well as the development of generator performance standards packages.

New Zealand
Wellington
+64 4 232 7680

Australia
Fortitude Valley, QLD
+61 1300 933 632

North America
Kirkland, WA
+1 425 822 8489

Europe
Warwick, UK
+44 1926 675 851

Asia
Singapore
+65 (800) 616 3283

CONTACT US